

CLAIMS:

1. An inorganic, quasi-amorphous oxide compound of a metal, mixture of metals or semiconducting element, said compound having pyroelectric properties.

2. The compound of claim 1 having the formula $(A_xB_{1-x})_pO_n$, wherein A and B are independently selected from transitions metals, elements of Group IVA of the periodic table, alkali metals, alkali earth metals and rare earth metals; x has values of between 0 to 1; p is an integer having the values 1, 2 or 3; and n is an integer having the value of 1, 2, 3 or 4.

3. The compound of claim 2, wherein A is a transition metal or an element of Group IVA of the periodic table, x is 1 and p is 2.

4. The compound of claim 1, having the formula $(A_xB_{1-x})(C_yD_{1-y})O_n$ wherein A and B are independently selected from alkali metals, alkali earth metals, rare earth metals and elements of Group IVA of the periodic table; C and D are independently selected from transition metals and alkali earth metals; x and y have values of between 0 to 1; and n is an integer having the value of 1, 2 or 3.

5. The compound of claim 4, wherein A and B are independently selected from Ba, Sr, Ca, Pb, La, Eu, Li, Na, K and Cs ; C and D are independently selected from Ti, Zr, Nb, Ta, Sc, Mg and V; and n is 3.

6. The compound of claim 5, wherein A and B are independently selected from Ba, Sr, Ca, Pb, La and Eu.

7. The compound of claim 5, wherein A and B are independently selected from Li, Na, K and Cs.

8. The compound of claim 5, wherein C and D are independently selected from Ti and Zr.

9. The compound of claim 6, wherein C and D are independently selected from Ti and Zr.

10. The compound of claim 7, wherein C and D are independently selected from Ti and Zr.

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11. The compound of claim 5, wherein C and D are independently selected from Nb, Ta, Sc, Mg and V.

12. The compound of claim 6, wherein C and D are independently selected from Nb, Ta and V.

5 13. The compound of claim 7, wherein C and D are independently selected from Nb, Ta and V.

14. The compound of claim 4, wherein $y=0$ and having the formula $(A_xB_{1-x})DO_3$, wherein A, B, D and x are as defined in claim 4.

10 15. The compound of claim 4 having a pyroelectric coefficient of between about 10^{-12} C/(cm² x K) and about 10^{-7} C/(cm² x K).

16. The compound of claim 14 having a pyroelectric coefficient of between about 10^{-12} C/(cm² x K) and about 10^{-7} C/(cm² x K).

17. The compound of claim 4 selected from BaTiO₃, CaTiO₃, PbTiO₃, Pb(ZrTi)O₃, Pb(Zr_{0.35}Ti_{0.65})O₃, (PbCa)TiO₃, (PbLa)(ZrTi)O₃, PbLaTiO₃,
15 Pb(ScTa)O₃, Pb(ScNb)O₃, Pb(MgNb)O₃, SrTiO₃, (Sr_{0.65}Ba_{0.35})TiO₃, (Ba_{0.70}Sr_{0.30})TiO₃ and EuTiO₃.

18. The compound of claim 17 having a pyroelectric coefficient of between about 10^{-12} C/(cm² x K) and about 10^{-7} C/(cm² x K).

19. The compound of claim 17 being selected from BaTiO₃, PbTiO₃ and
20 SrTiO₃.

20. The compound of claim 18 being BaTiO₃.

21. A process for preparing pyroelectric compound, comprising applying a mechanical strain to a substantially amorphous compound of the formula $(A_xB_{1-x})(C_yD_{1-y})O_n$ as defined in claim 4, said mechanical strain being controlled so as to
25 prevent crystallization of said compound, thereby obtaining inorganic quasi-amorphous compound having pyroelectric properties.

22. The process of claim 21, wherein said mechanical strain is obtained by a temperature gradient.

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23. The process of claim 21, wherein said amorphous compound has the formula $(A_xB_{1-x})DO_3$, wherein A, B, D and x have the meanings as defined in claim 14.

24. Inorganic quasi-amorphous compound of the formula $(A_xB_{1-x})(C_yD_{1-y})O_3$ as defined in claim 14 preparable by the process of claim 21.

25. A device comprising the compound according to claim 1 in the form of a film coating on a substrate.

26. A device comprising the compound according to claim 4 in the form of a film coating on a substrate.

27. The device of claim 26, wherein the substrate is selected from Si, SiO_2 and glass.

28. The device of claim 27, wherein the thickness of the coating layer is below 0.5 micron.

29. A device comprising the compound of claim 1, the device being operable as a sensor for sensing an external field including at least one of the following: temperature field, magnetic field and electric field.

30. A device comprising the compound of claim 4, the device being operable as a sensor for sensing an external field including at least one of the following: temperature field, magnetic field and electric field.

31. A device having an acoustic wave propagation element including the compound of claim 1.

32. A device having an acoustic wave propagation element including the compound of claim 4.

33. A device having an acoustic wave propagation element including the compound of claim 5.

34. A birefringent medium comprising the compound of claim 1.

35. A birefringent medium comprising the compound of claim 4.

36. A device comprising the compound according to claim 1.

37. A device comprising the compound according to claim 4.

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38. A device comprising a compound according to claim 3 in the form of a film coating on a substrate.

39. The device of claim 38, wherein the substrate is selected from Si, SiO₂ and glass.

5 40. The device of claim 39, wherein the compound is SiO₂.